OIPE IAP55 APR 25 2006 PATENT & TRADEMARK OFFICE

CONNECTION VERIFYING DEVICE AND CONNECTION VERIFYING STRUCTURE FOR A PIPE AND A CONNECTOR

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a connection verifying device and a connection verifying structure for a pipe and a connector to verify that a pipe correctly snap-fits in and is mechanically connected to a connector which is adapted, for example, in assembly in a gasoline fuel piping of an automobile.

[0002] In a fluid piping structure, for example, a gasoline fuel piping structure where a tube is joined to a pipe, a connector is used for joining the tube to the pipe. In such piping system, for example, the pipe is formed with an annular engagement projection on and around an outer peripheral surface of an inserting side to define an inserting end portion. Then, the inserting end portion of the pipe is inserted and fitted in the connector so that the annular engagement projection snap-engages in the connector to provide locking relation between the pipe and the connector. In such a manner, connection between the pipe and the connector is completed. A connector or a quick connector adapted in this manner comprises a tubular connector housing provided with a tube connecting portion on one end of the connector housing along an axis of the connector housing and a retainer holding portion on the other end thereof, and retainer means which is held by the retainer holding portion of the connector housing. The retainer means is formed in an annular or generally annular shape and has, for example, an engagement slit as connection engageable portion or a projecting engagement claw of which one axial end or one axial end portion is formed as connection engageable portion. The inserting end portion of the pipe is inserted in the connector or the connector housing via an opening so that the annular engagement projection of the pipe snap-engages with the engagement slit or the projecting engagement claw, and thereby the pipe is fitted in and mechanically connected to the connector.

[0003] Here, the annular engagement projection of the pipe progresses or moves relatively in an axial direction while deforming the retainer means and consequently is engaged with the engagement slit or the projecting engagement claw. Therefore, unless an operator takes care sufficiently to complete connection between the pipe and the connector, the inserting end portion of the pipe might not be fully inserted into the retainer holding portion of the connector housing, or the annular